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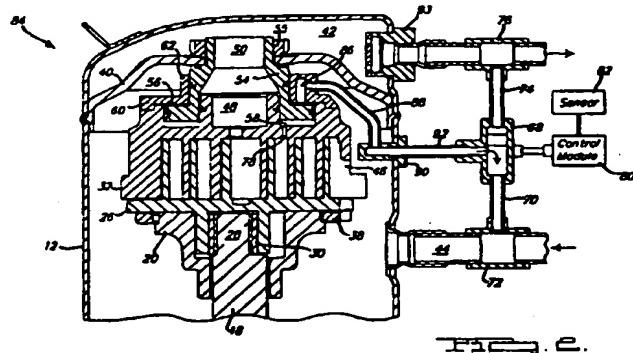
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### (54) Capacity modulated scroll machine

(57) A scroll-type machine is disclosed which is particularly well suited for use as a compressor in refrigeration and air conditioning systems and incorporates a unique arrangement for modulating the capacity thereof. In one group of embodiments the capacity of the scroll-type machine is modulated by relative axial movement between the scroll members so as to form a leakage path across the wrap tips and opposed end plates. In another group of embodiments, modulation is achieved by reducing the orbital radius of one of the scroll members to thereby form a leakage path across the flank surfaces of the wraps. Both types of scroll separation may be accomplished in a time pulsed manner to thereby enable a full range of modulation with the duration of the loading and unloading periods being selected to maximize the efficiency of the overall system. A motor control arrangement is also disclosed which may be used with either of the modulation methods mentioned above to increase the efficiency of the motor during periods of reduced load. Additionally, either of the modulation arrangements mentioned above may be combined with a delayed suction form of capacity modulation with or without the motor control feature to thereby achieve better operating efficiency under certain conditions.





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## EUROPEAN SEARCH REPORT

Application Number

EP 95 30 7811

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	WO 86 01262 A (SUNDSTRAND CORPORATION) 27 February 1986	1,7-9, 11, 13-15,18 2-5,20, 21,23, 32-36	F04C29/10 F04C18/02
Y	* page 2, last paragraph - page 3, line 32 * * page 5, line 8 - page 11, line 13; figures 1,2 *	---	
X	US 5 342 186 A (SWAIN) 30 August 1994	1,7,8, 10,13-16	
Y	* column 2, line 5 - line 53 * * column 4, line 42 - column 5, line 35; figure 1 * * column 6, line 33 - column 7, line 58; figures 2-4 *	2-5,20, 21,23, 32,35,36	
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		-/-	
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	1 December 1998	Kapoulas, T	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons S : member of the same patent family, corresponding document	
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
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Y	US 4 604 036 A (MASATSUNE SUTOU) 5 August 1986 * column 1, line 15 - line 34 * * column 1, line 54 - column 2, line 3; figure 1 * * column 3, line 6 - column 4, line 36; figures 4,5 *	4,5,32, 35,36	
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The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	1 December 1998	Kapoulas, T	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons B : member of the same patent family, corresponding document	
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